

# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

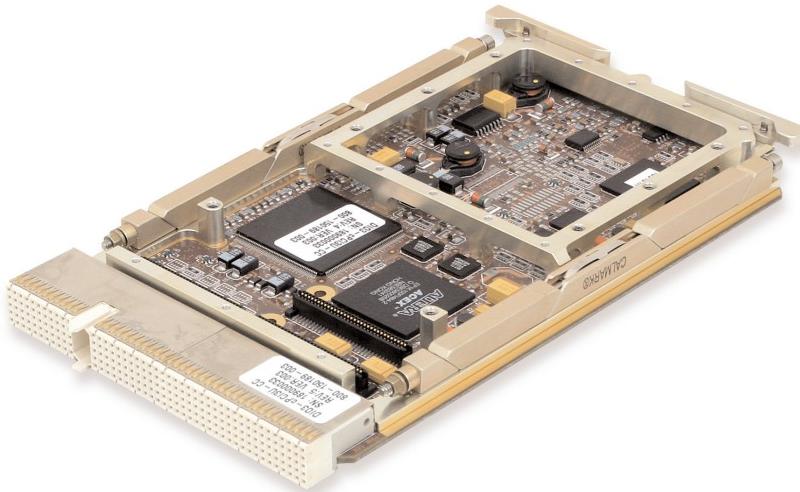
- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

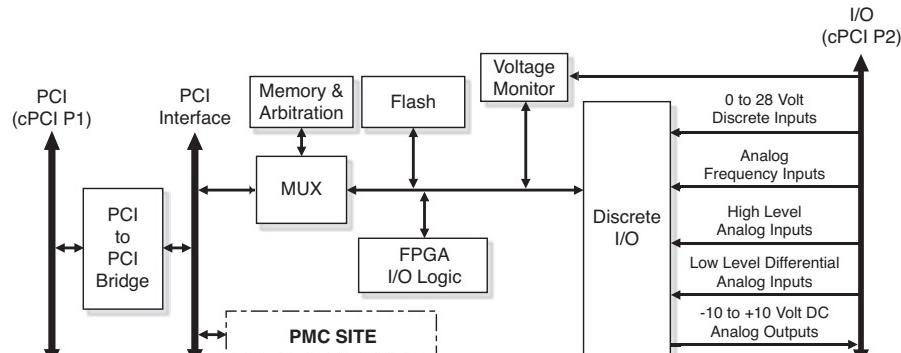
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.

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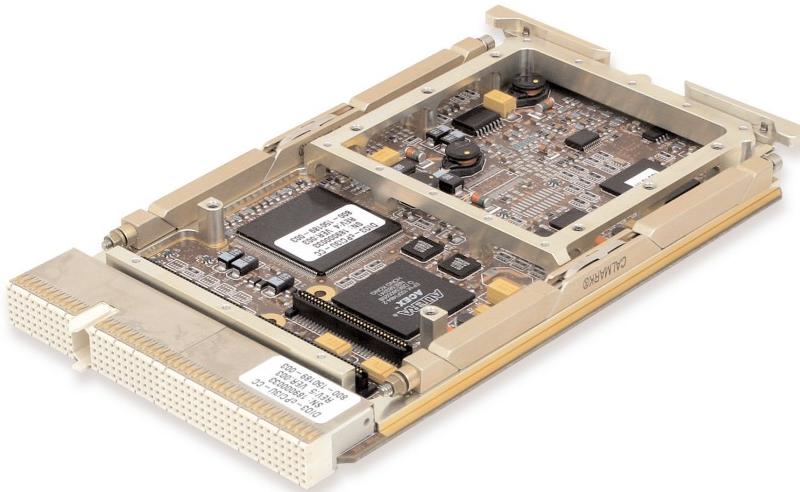
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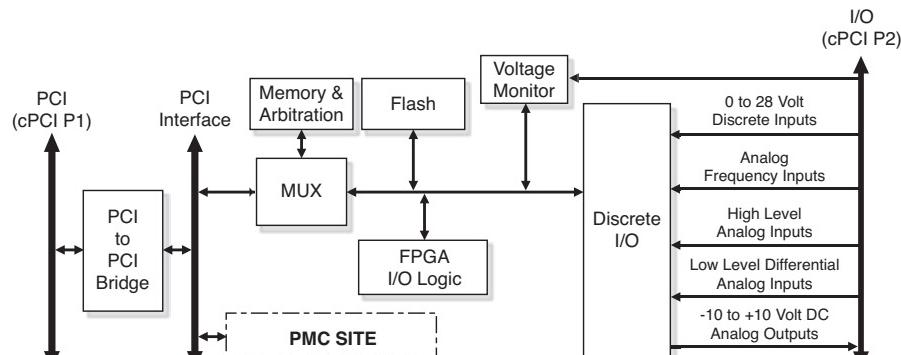
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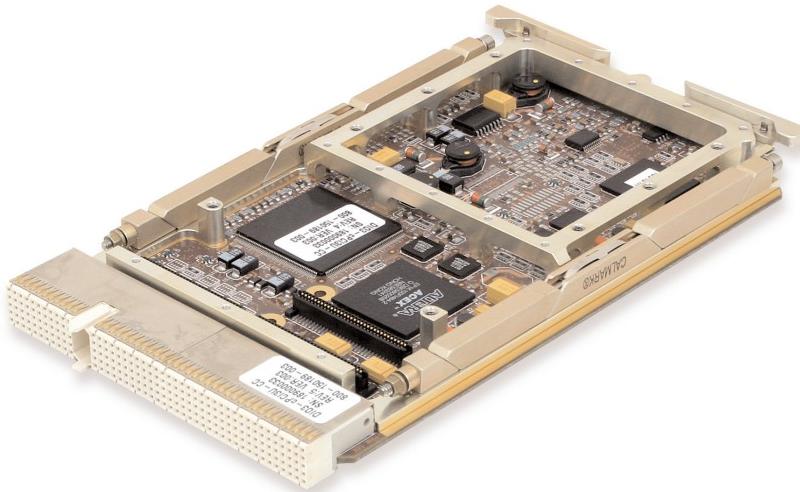
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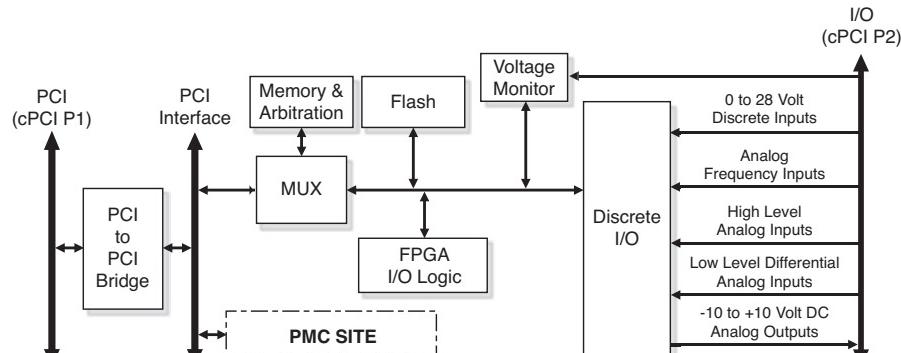
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#### Data Bus

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#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
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### Temperature

- Operating: -40° to 85° C
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### Humidity

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- Approximately 0.159 kg (0.35 lb.)

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- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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- >70,000 hours

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- Designed and tested to ISO-9001 certified procedures

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- BIT monitoring for failure detection

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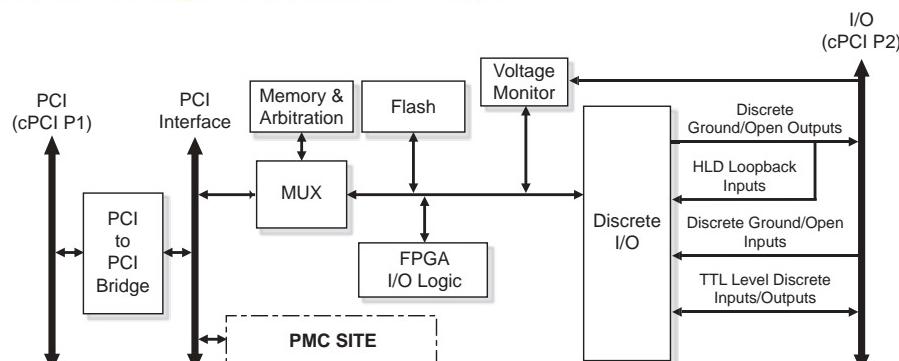


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- 5 VDC standard
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#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

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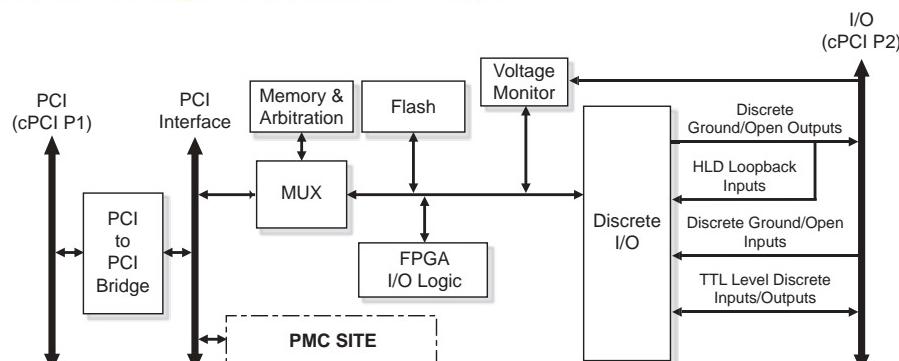


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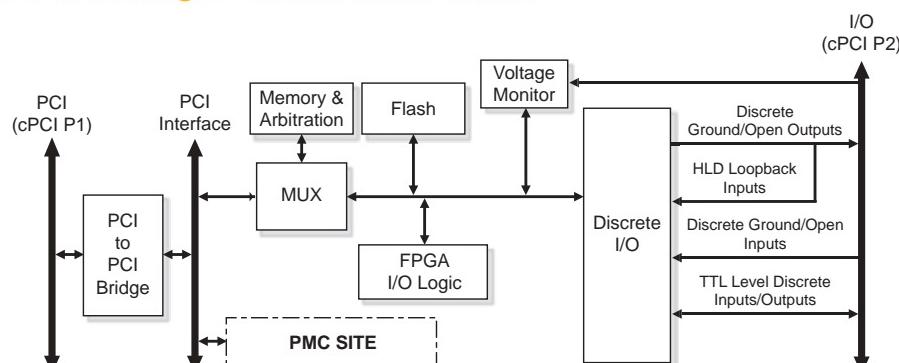


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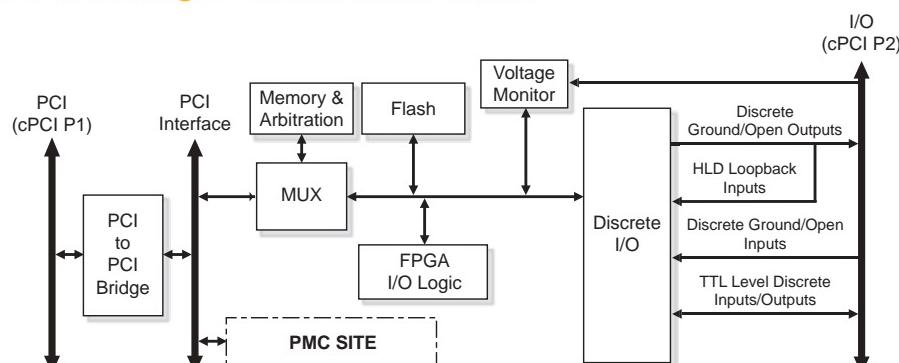


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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Corporate Headquarters

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

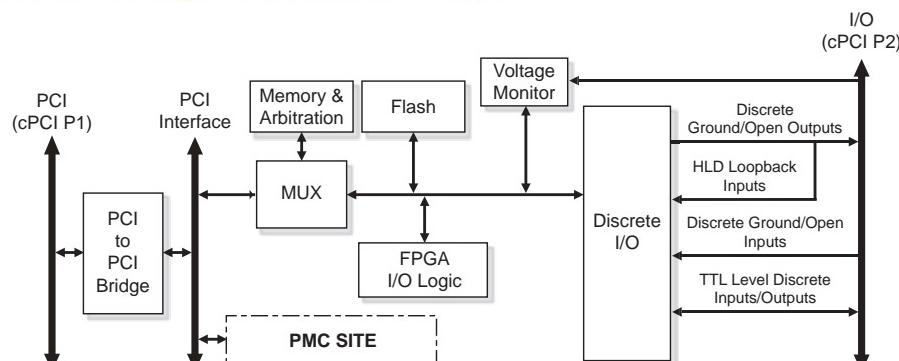


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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
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- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

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- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

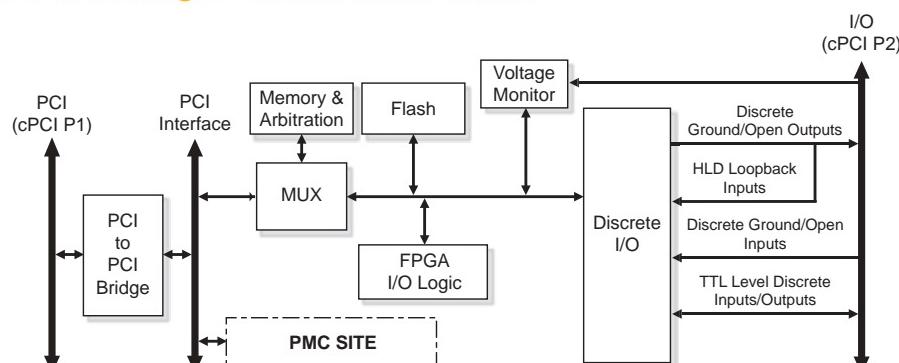


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
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- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

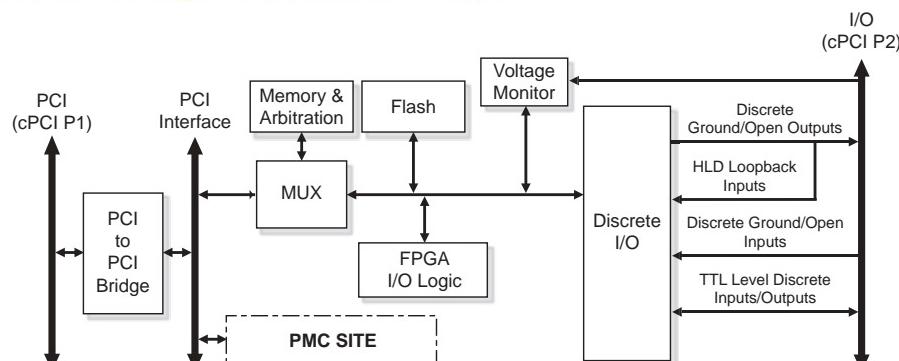


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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

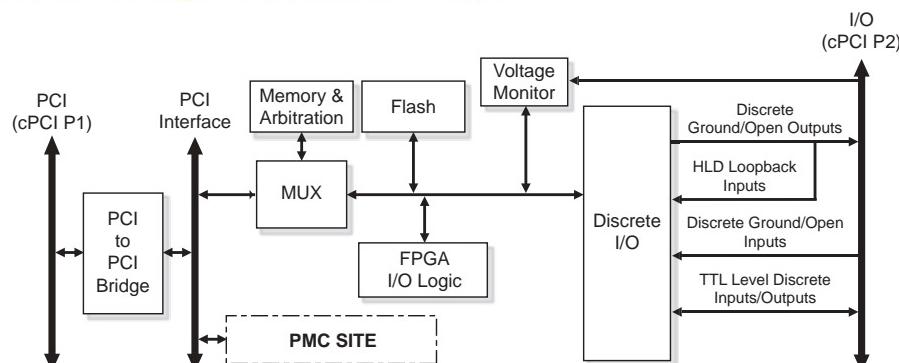


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

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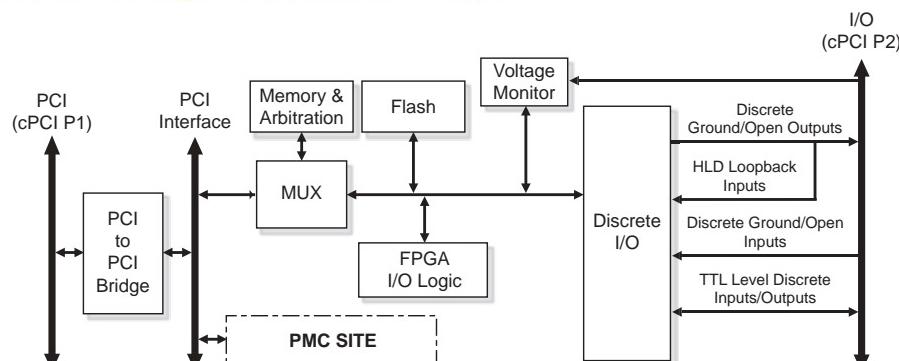


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# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
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### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
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- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
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### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Corporate Headquarters

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Email: info@sbs.com

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

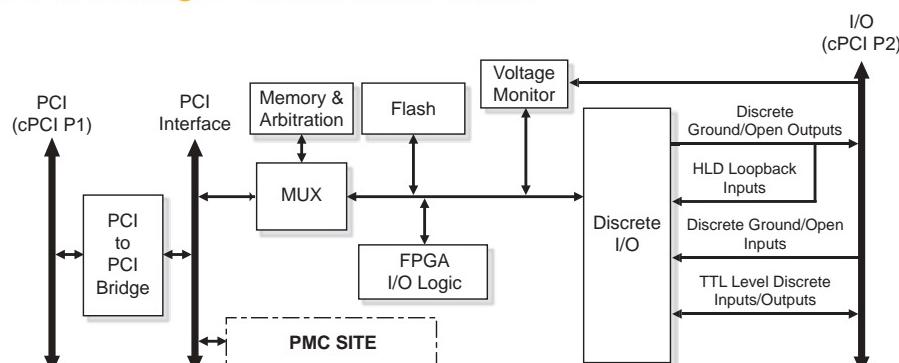


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
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- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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#### Voltage Monitor

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#### cPCI Interface

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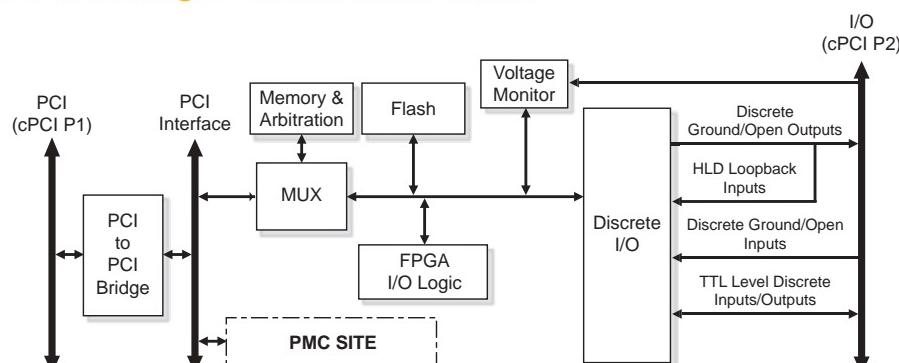


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- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
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### Temperature

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- Storage: -55° to +95° C

### Humidity

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### Weight

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- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

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#### Memory Area

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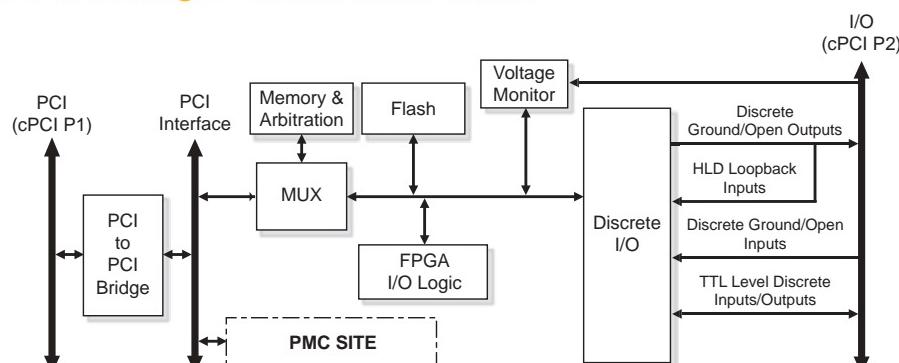


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
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- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

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#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

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- 24 Discrete Ground/Open Inputs  
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#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
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#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

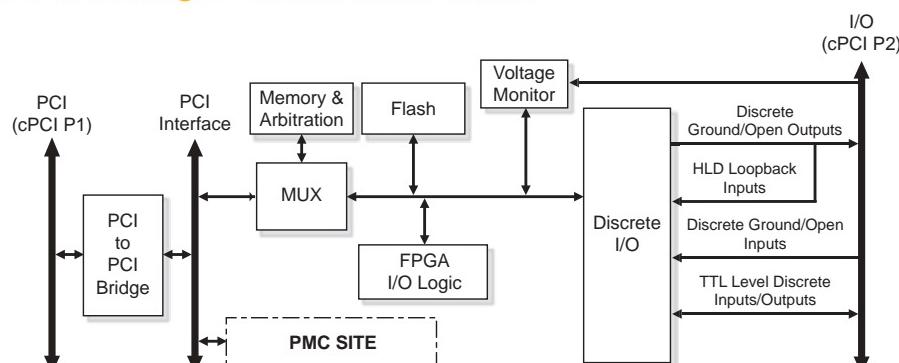


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
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30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
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### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
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### Temperature

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### Humidity

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### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

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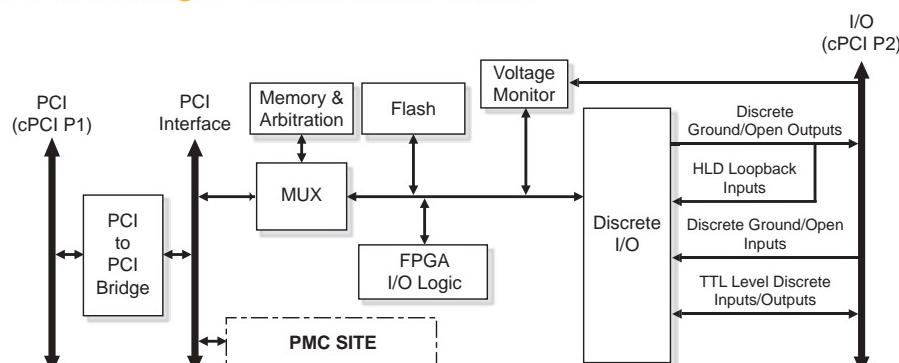


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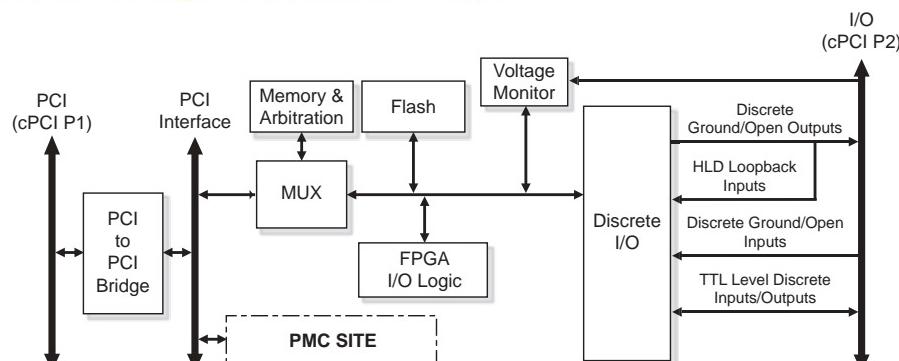


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Corporate Headquarters

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

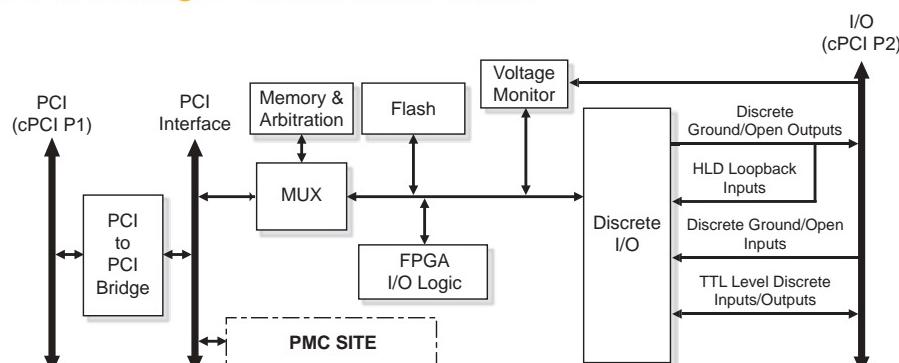


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

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### Conformal Coating

### Quality Assurance

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### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

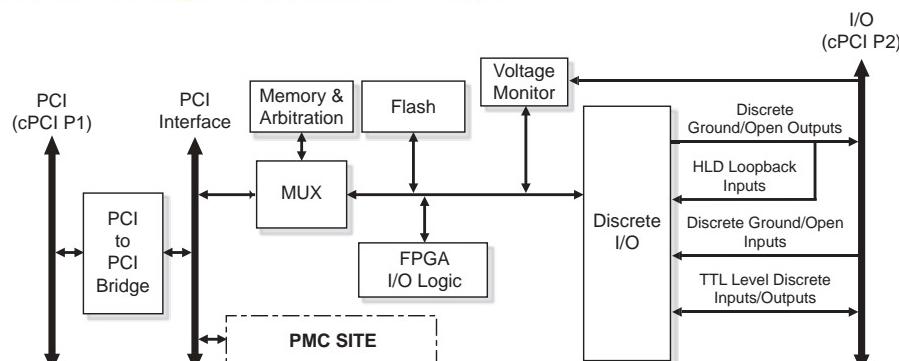


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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
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- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

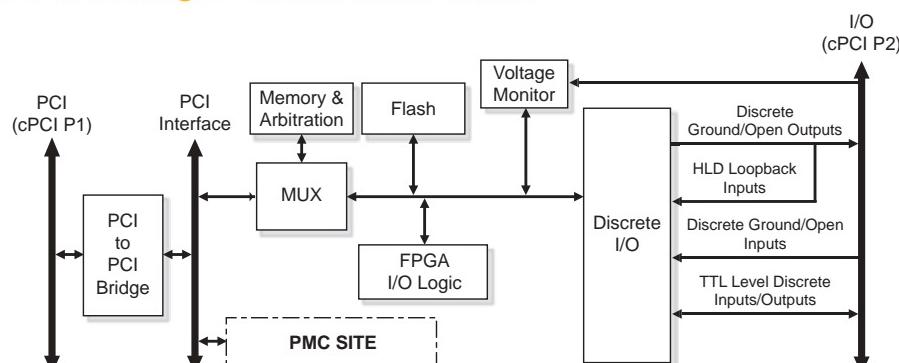


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

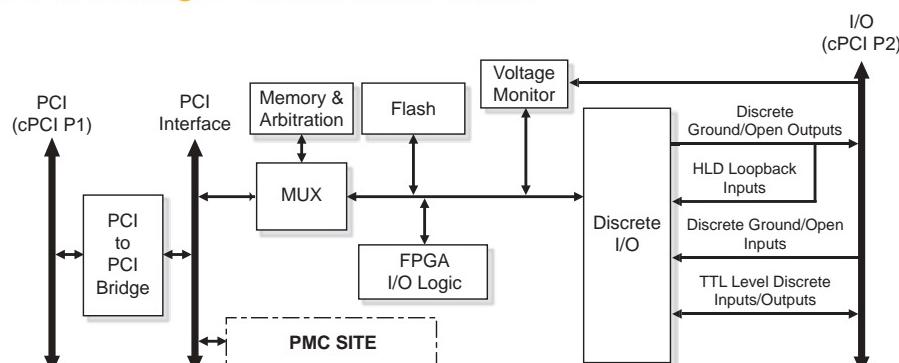


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

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#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
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- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
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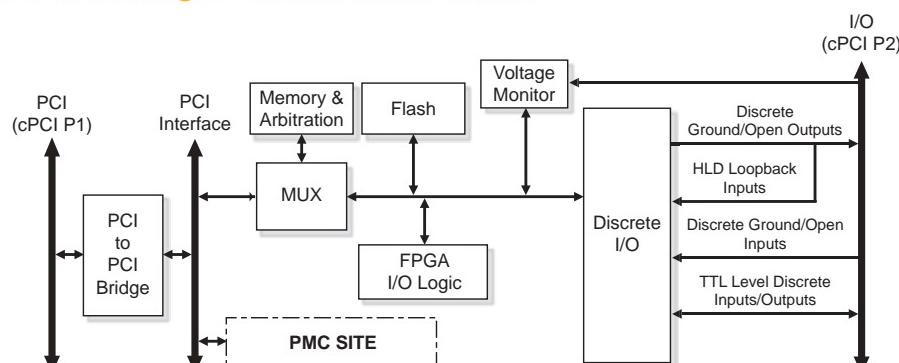


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# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
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- 16 Discrete Ground/Open Outputs
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- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

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- Approximately 0.159 kg (0.35 lb.)

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

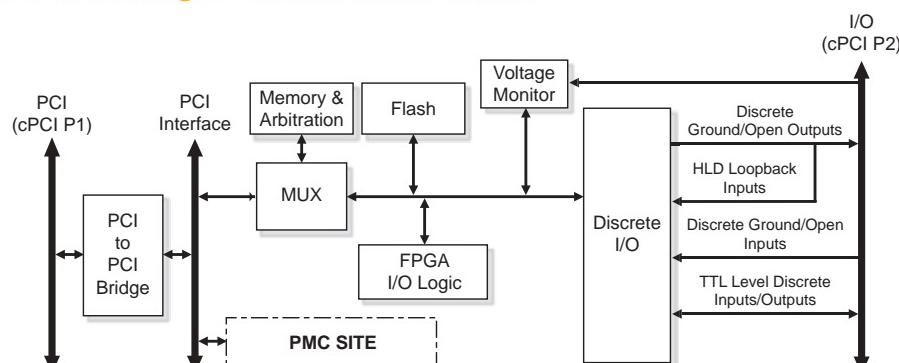


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

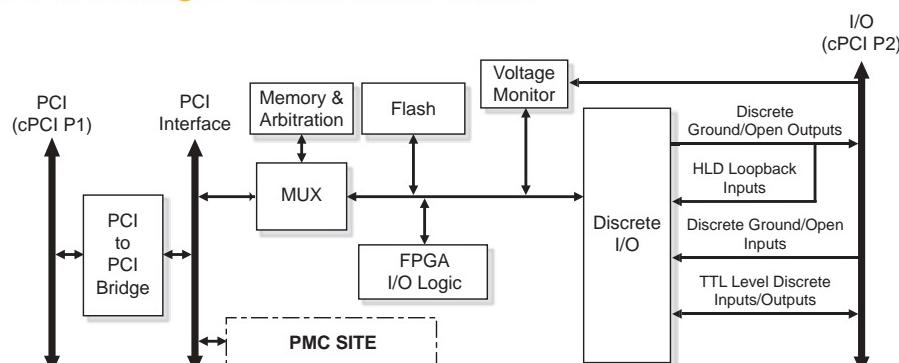


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

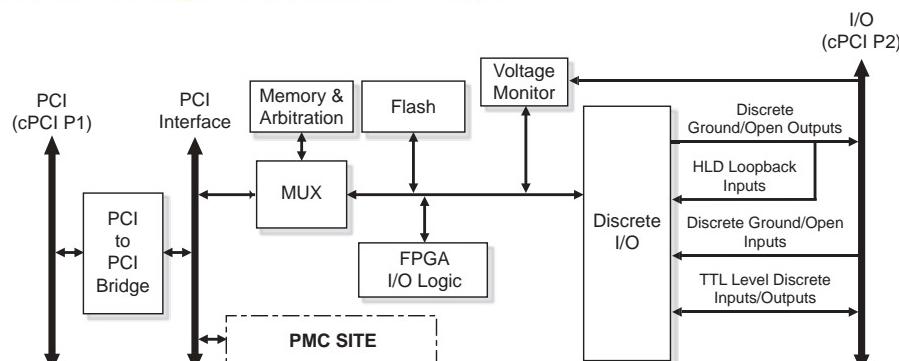


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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO4-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 24 Discrete Ground/Open Inputs  
0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 TTL Level Discrete Outputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique customer protocols

#### Software Programming

- DSP and FPGA configuration data stored in Flash memory

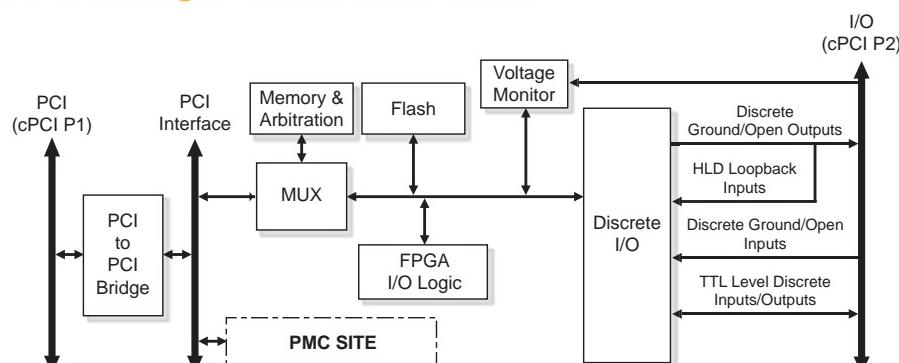


**DIO4-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, High Level Discrete (HLD) Loopback inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO4-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.

#### Simplified Block Diagram of DIO4-cPCI-CC Card



The module receives input power from the power supply via the cPCI bus. A secondary voltage of +5 V is standard, and optional voltages of +3.3 V, +12 V, and -12 V supplied either from the backplane or generated onboard, are available. Discrete output interfaces include discrete ground/open outputs and general purpose TTL digital outputs. The DIO4 also provides HLD loopback inputs and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO4-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 24 Discrete Ground/Open Inputs 0 to 28 V
- 16 TTL Level Discrete Inputs
- 16 HLD Loopback Inputs
- 16 Discrete Ground/Open Outputs
- 16 TTL Level Discrete Outputs
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1

#### Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

#### Input Power

- 5 VDC standard
- 3.3 VDC, +12 VDC, and -12 VDC optional on backplane or onboard

#### I/O Connectors

- Per IEC 61076-4-101

### Model Number

DIO4-cPCI-CCAR0

### Configuration

cPCI to DIO, Conduction Cooled

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### MTBF

- >70,000 hours

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

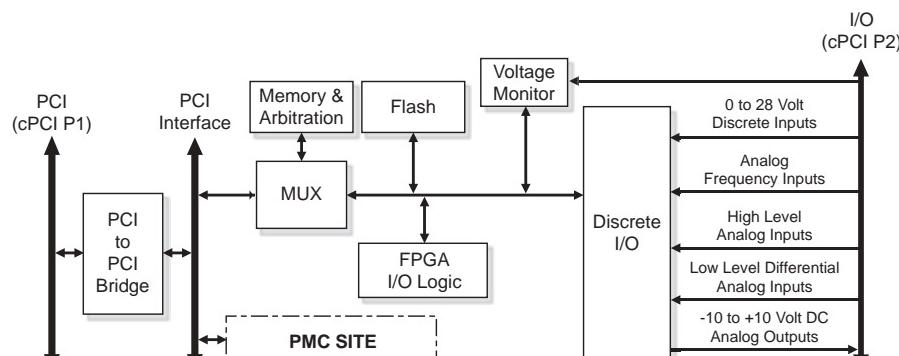
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

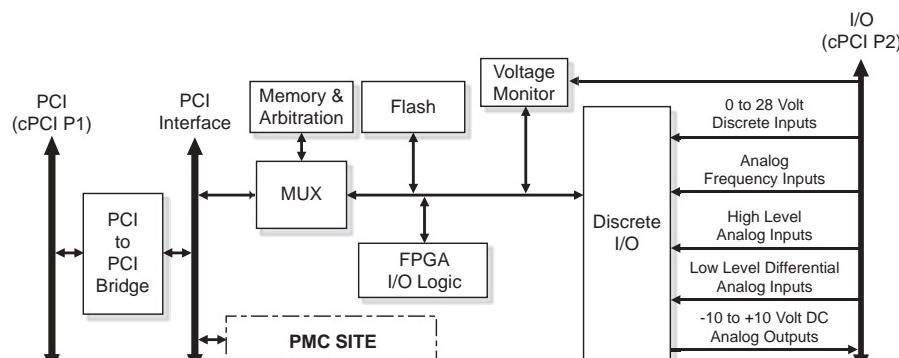
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

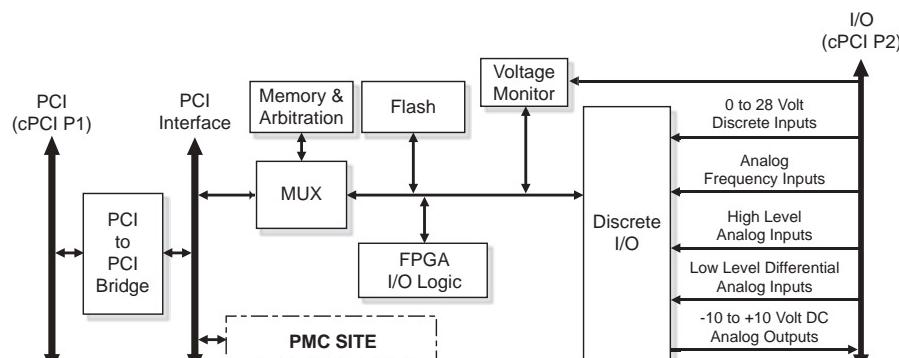
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

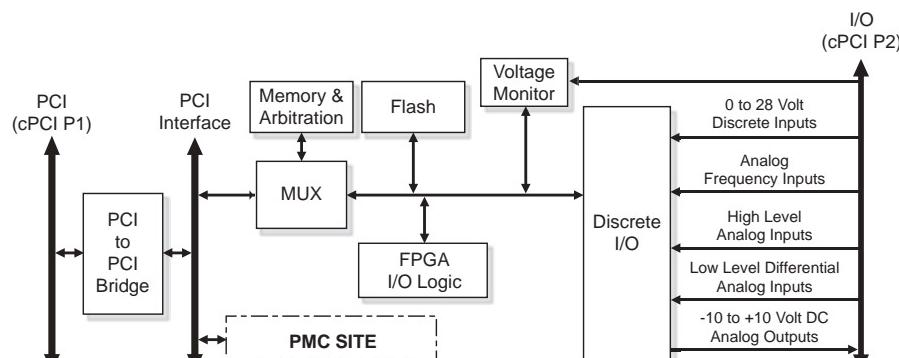
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs  $\pm$ 10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

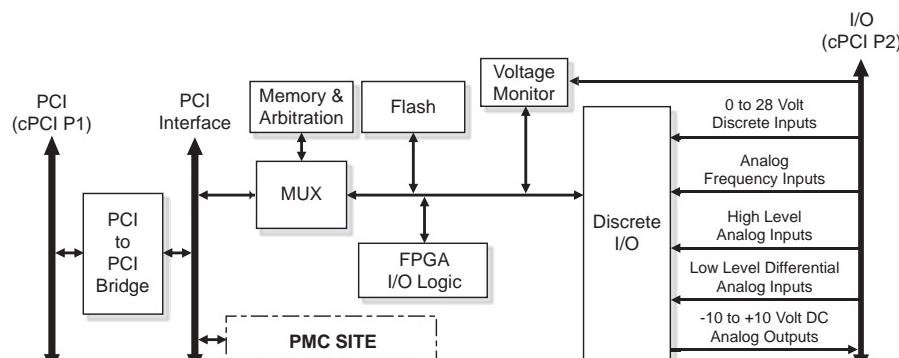
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

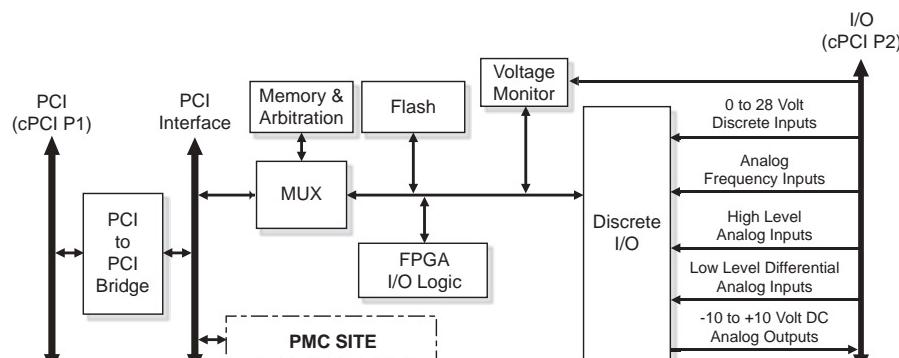
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

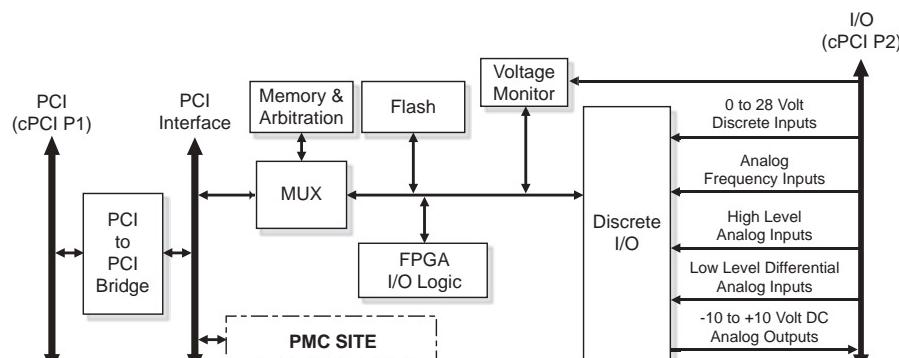
- DSP and FPGA configuration data stored in Flash memory



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DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
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- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### Corporate Headquarters

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

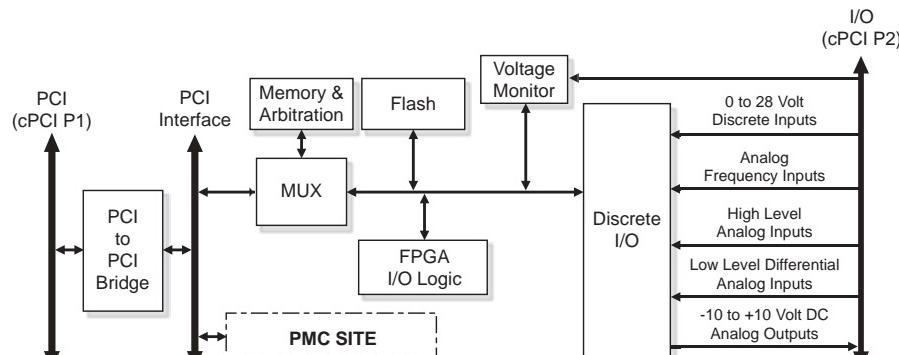
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
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#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

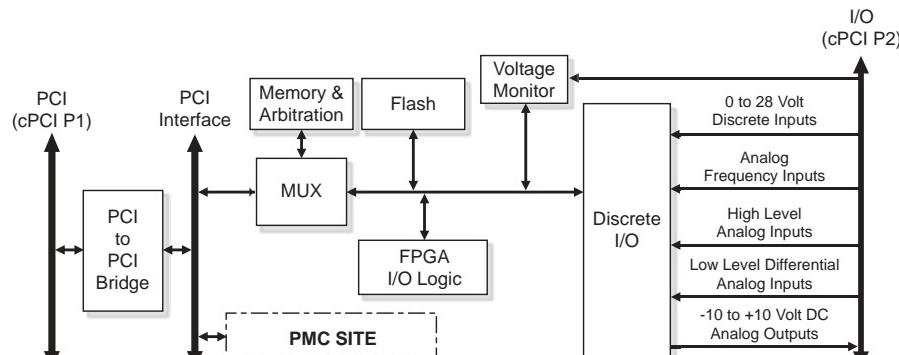
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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

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- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

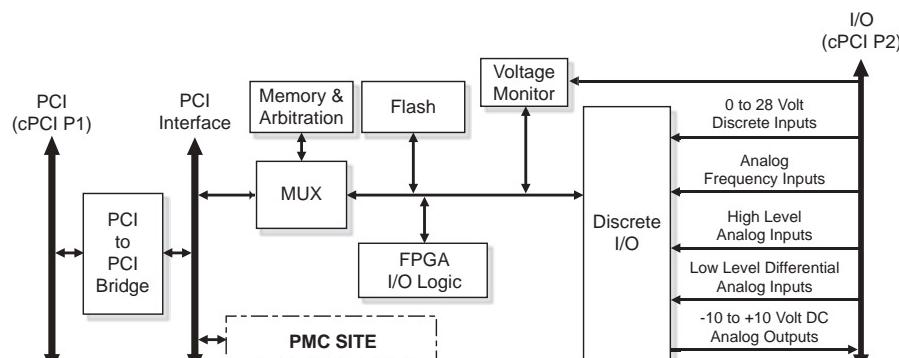
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs  $\pm$ 10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

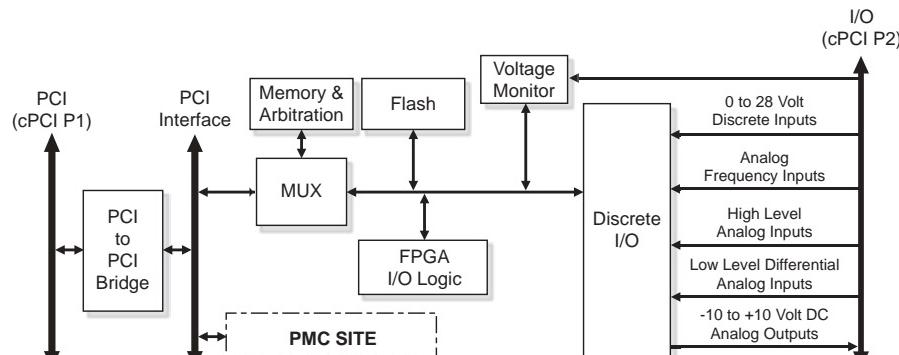
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**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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### Features

#### 3U cPCI Conduction Cooled

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- 32-bit 33 MHz

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- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

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- 128 k Words of SRAM and 256 k Words of Flash memory

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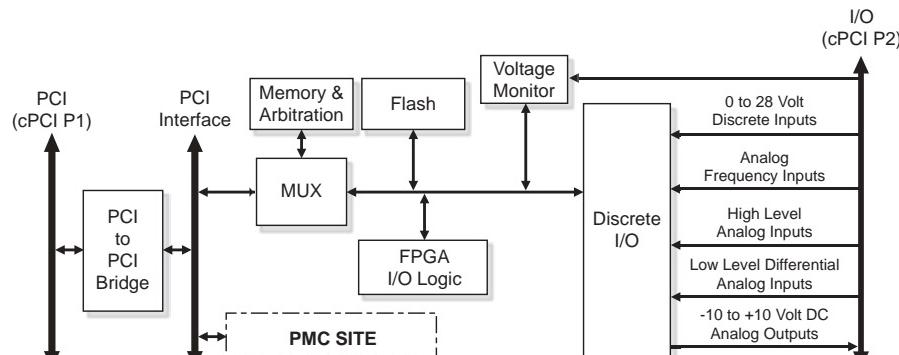
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The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
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30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
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- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

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### Built-in Test Capability

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- +5 Volts  $\pm$  5% at 0.2 A maximum
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- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

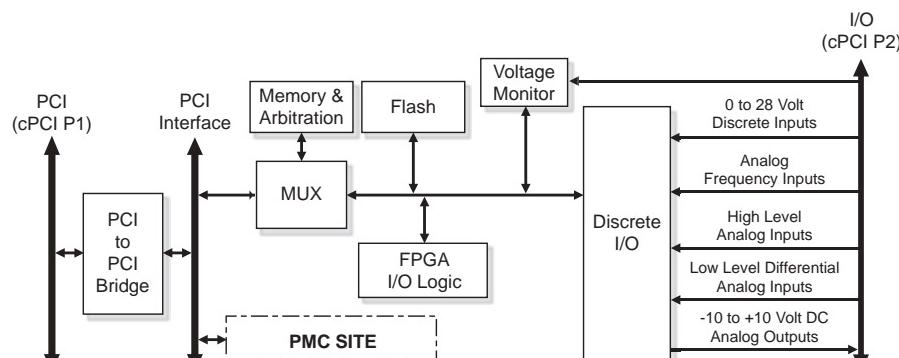
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

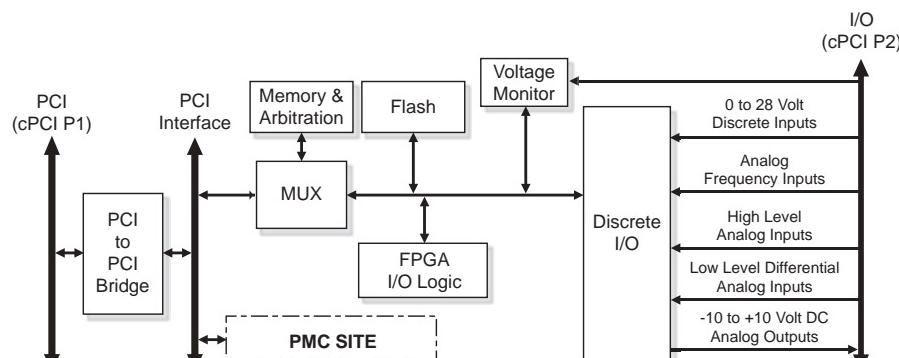
- DSP and FPGA configuration data stored in Flash memory



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DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

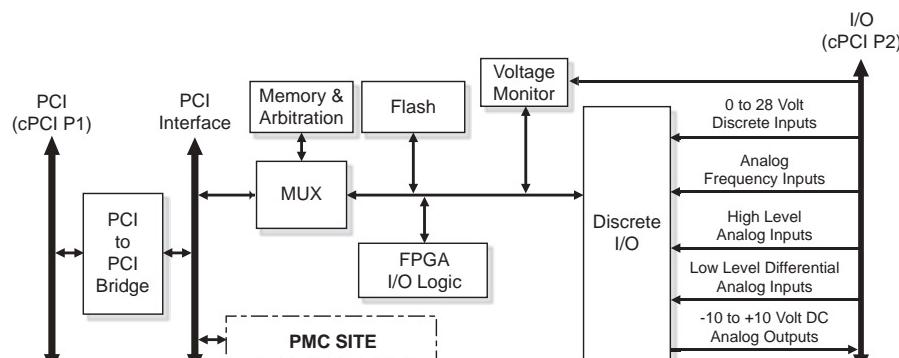
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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

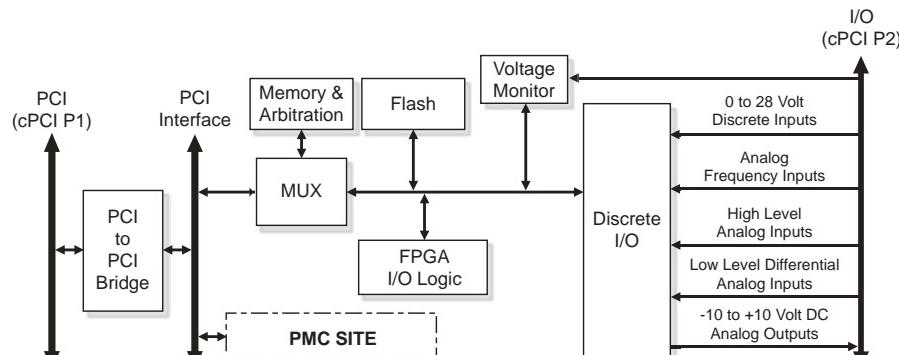
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs  $\pm$ 10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

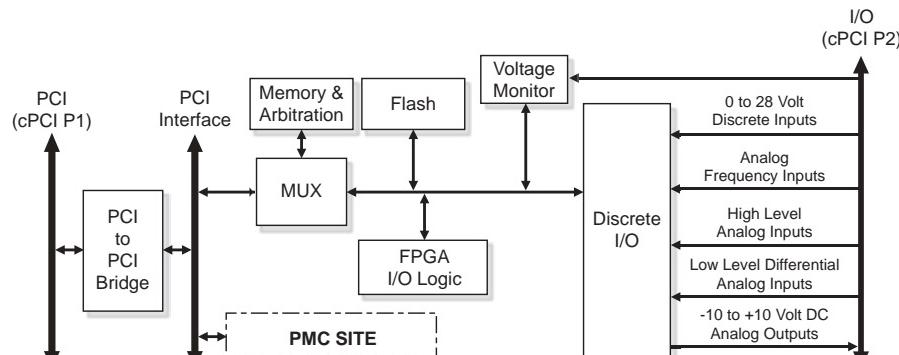
- DSP and FPGA configuration data stored in Flash memory



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DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
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- 6 DC Programmable Analog Outputs -10 to +10 Volt
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#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

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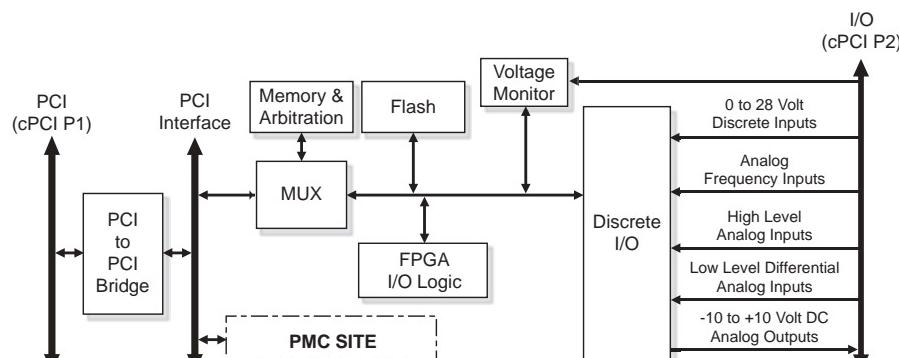
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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

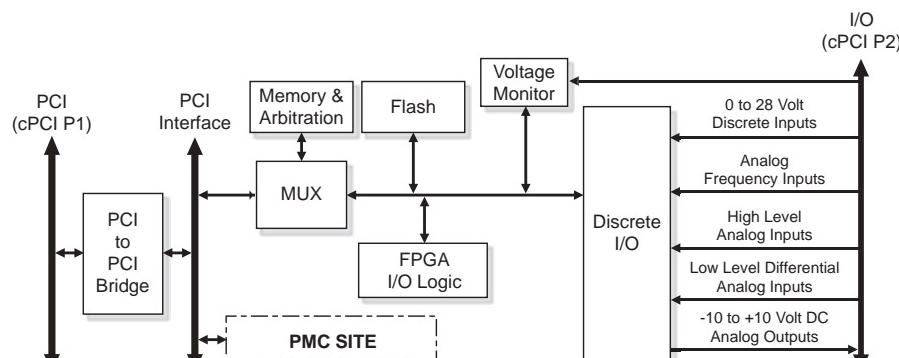
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

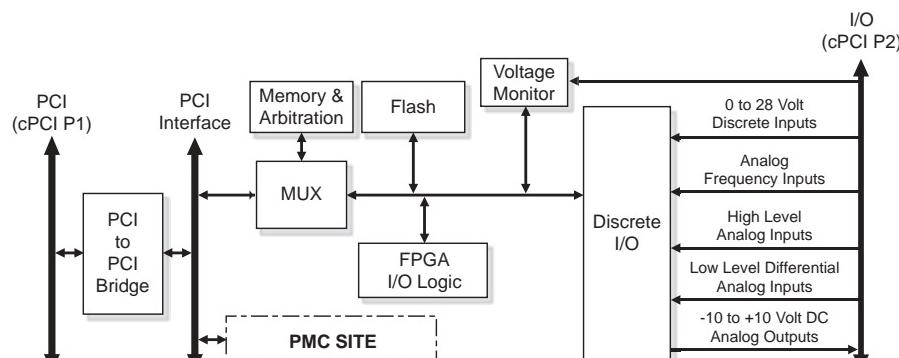
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

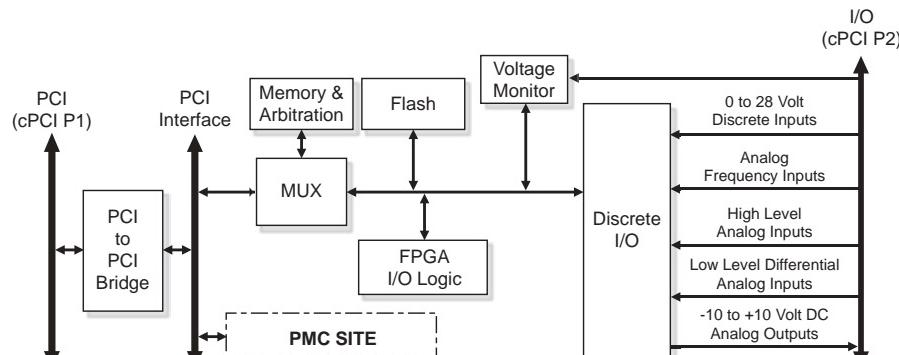
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs  $\pm$ 10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

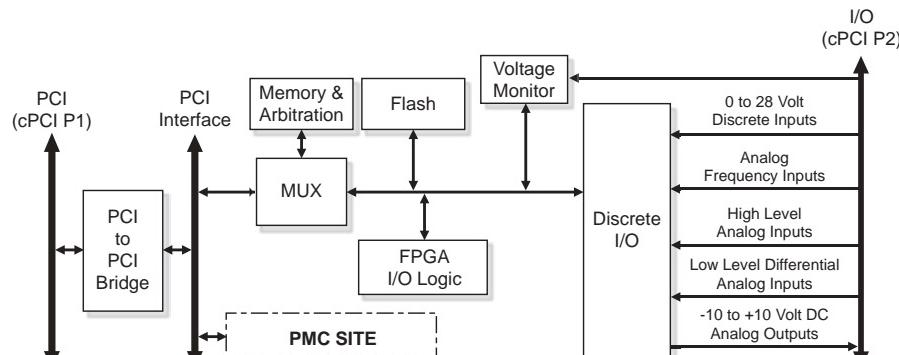
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs (5 to 20 Volts)
- 28 Low-Level Differential Analog Inputs
- 6 Programmable Analog Outputs -10 to +10 VDC
- Four Excitation Outputs  $\pm$ 10 Volt
- 2 Gear sensor Inputs
- 1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages
- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

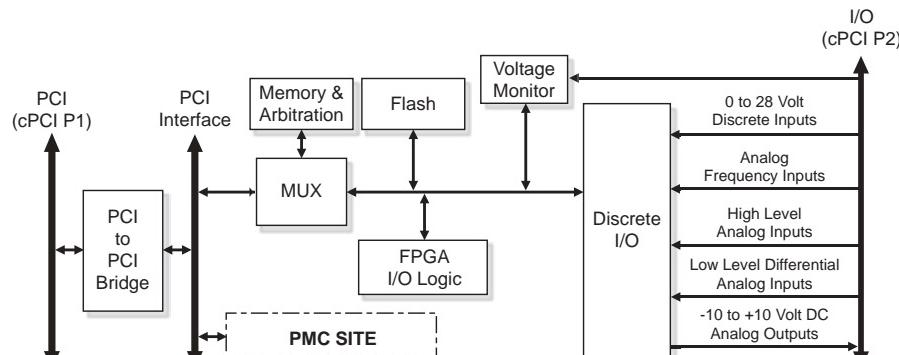
- DSP and FPGA configuration data stored in Flash memory



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Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



**Simplified Block Diagram of DIO3-cPCI-CC Card**

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.



# DIO3-cPCI-CC

## Configurations

## Specifications

### Form Factor

- 3U cPCI

**Designed in Accordance  
with IEEE 1101.2 and VITA  
30.1**

### Electrical Interfaces

- 32 Discrete Inputs 0 to 28 Volt
- 4 Analog Frequency Inputs
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- 1 cPCI interface - conforms to requirements of PICMG 2.0 R2.1 for Target board

### DIO I/O and Control Functions - J1 Data Bus

- 32 Bit cPCI

### DIO I/O and Control Functions - J2 I/O

- Input and output flexibility provided via software programmability and configurable biasing circuitry

Model Number	Configuration
DIO3-cPCI-CCAR0	cPCI to DIO, Conduction Cooled

### Input Power

- 5 VDC and 28 VDC standard
- 3.3 VDC optional on backplane, or onboard

### MTBF

- >70,000 hours

### I/O Connectors

- Per IEC 61076-4-101

### Conformal Coating

### Quality Assurance

- Designed and tested to ISO-9001 certified procedures

### Built-in Test Capability

- BIT monitoring for failure detection

### Power Requirements

- +5 Volts  $\pm$  5% at 0.2 A maximum
- +3.3 Volts  $\pm$  5% at 0.4 A maximum

### Temperature

- Operating: -40° to 85° C
- Storage: -55° to +95° C

### Humidity

- 5% to 95%, non-condensing

### Weight

- Approximately 0.159 kg (0.35 lb.)

### Dimensions

- 3U Euroboard, 100.0 mm x 160.0 mm

### Vibration

- Random - 0.05 g<sup>2</sup>/Hz, 20-2,000 Hz for 1 hour on each axis
- Endurance - 0.06 g<sup>2</sup>/Hz for 3 hours on each axis

### Corporate Headquarters

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# DIO3-cPCI-CC

## DSP-Based Input/Output Module

### Features

#### 3U cPCI Conduction Cooled

#### PMC Mezzanine

- Supports a conduction cooled PMC module
- 32-bit 33 MHz

#### Inputs/Outputs

- 32 0 to 28 Volt Discrete Inputs
- 4 Analog Frequency Inputs
- 11 High-Level Single Ended Analog Inputs
- 28 Low-Level Differential Analog Inputs
- 6 DC Programmable Analog Outputs -10 to +10 Volt
- 4 Excitation Outputs ±10 Volt
- 2 frequency gear sensor Inputs

#### I/O Controller

- Altera 1K series FPGA with embedded IP PCI core for main processor communications

#### Voltage Monitor

- 8-Channel, 10-Bit ADC for monitoring power supply secondary voltages

#### cPCI Interface

- Conforms to PICMG 2.0 R2.1 for a Target board

#### Memory Area

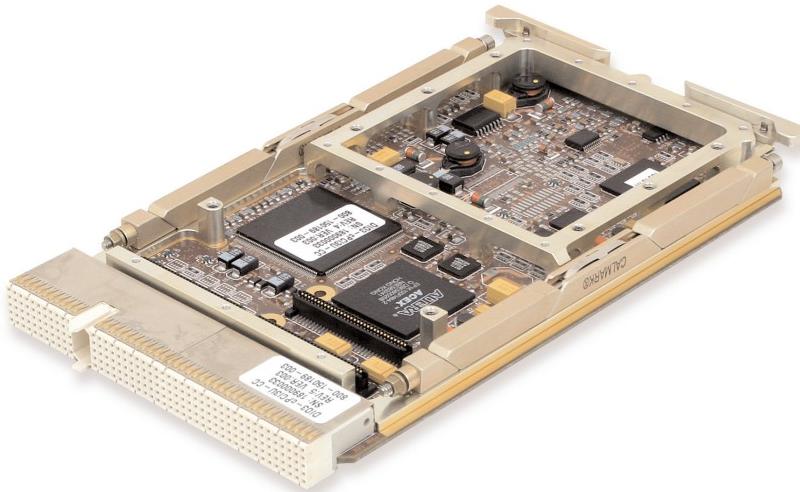
- 128 k Words of SRAM and 256 k Words of Flash memory

#### Versatile Microprocessor

- Texas Instruments TMS5402
- Microcode-based design for flexible support of unique protocols

#### Software Programming

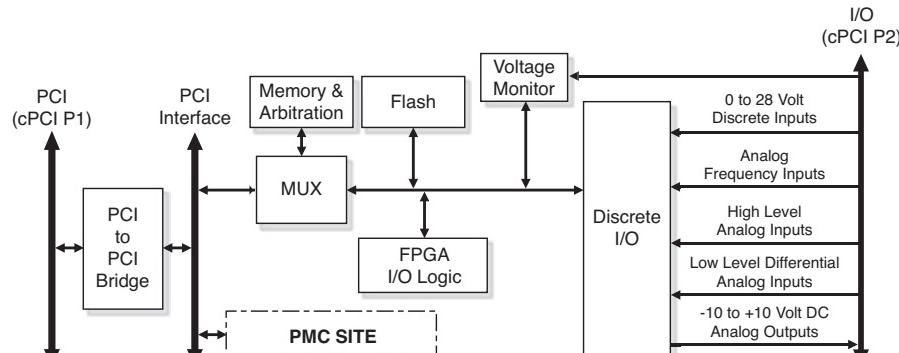
- DSP and FPGA configuration data stored in Flash memory



**DIO3-cPCI-CC** provides a highly versatile interface between the cPCI bus and DSP-Based inputs and outputs. Typical signal handling capabilities include Discrete Ground/Open outputs, Analog inputs, Gear Sensor inputs, and TTL level inputs and outputs. For added versatility, the card also includes a PCI Mezzanine Card Interface (PMC site). The ability to handle a wide variety of signals, perform on-the-fly signal processing, together with its conduction cooled temperature range makes the DIO3-cPCI-CC ideal for use in mission computers and other applications with harsh environmental demands.

DSP program code and FPGA configuration data can be downloaded and stored in FLASH memory via the host processor of the cPCI bus, allowing the card to combine the functionality of several individual speciality cards, saving precious backplane slots and the additional power, weight, and cooling requirements associated with those extra slots.

Signals move between the P1 connector on the PCI data bus, and external devices on the P2 connector, via a series of interfaces including a PCI-to-PCI Bridge, PCI interface, MUX, and a DSP core.



*Simplified Block Diagram of DIO3-cPCI-CC Card*

The module receives input power from the power supply via the cPCI bus. Secondary voltages of +5 V and +28 V are standard, and optional voltage of +3.3 V supplied either from the backplane or generated onboard, is available. Discrete output interfaces include bi-level optically coupled and bi-level and general purpose digital outputs. The DIO3 provides an excitation voltage output interface and includes an ADC for BIT monitoring of power supply secondary voltages.

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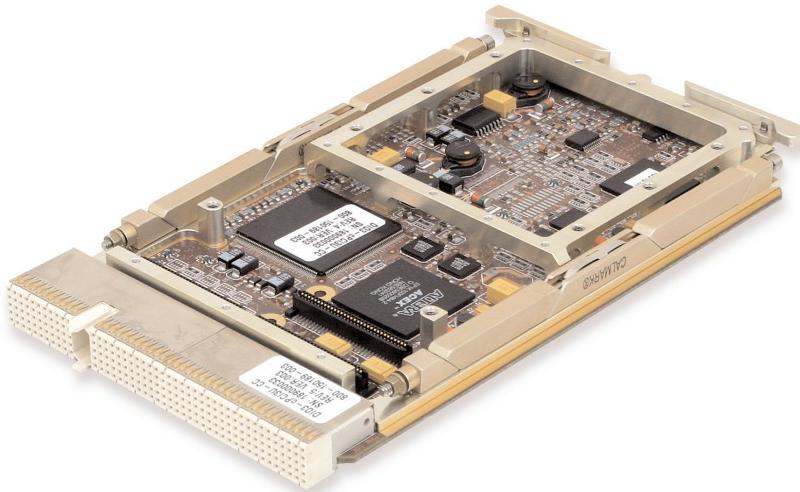
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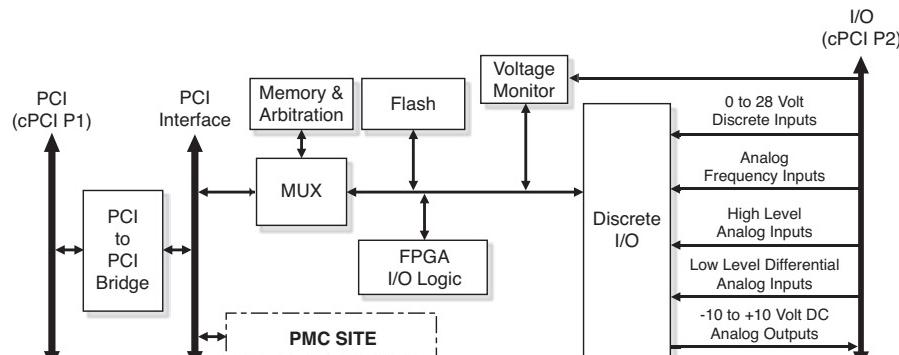
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